CLAIMS:

1. A distillation system for vaporizing a process liquid from a process liquid mass to obtain a vapour stream therefrom, said system comprising:

a distillation means comprising a distillation vessel and heating means for heating said process liquid within said vessel;

conduit means extending between and communicating with said distillation vessel and said process liquid mass,

said distillation vessel, said conduit means and said process liquid mass forming a closed system, whereby heating process liquid feed in said distillation vessel to vaporize liquid therefrom causes vapour to exit through said conduit means for recycling into said process liquid mass and subsequent cooling of said distillation vessel causes said vapour to condense within said distillation vessel and create a vacuum which draws further process liquid feed into said distillation vessel.

2. A distillation system for vaporizing a process liquid from a process liquid mass to obtain a vapour stream therefrom, said system comprising:

a distillation means comprising a distillation vessel and heating means for heating said process liquid within said vessel;

first conduit means extending between and communicating with said distillation vessel and said process liquid mass,

second conduit means for conveying vapour from said distillation vessel;

said distillation vessel, said first conduit means and said process liquid mass forming a closed system, whereby heating process liquid feed in said distillation vessel to vaporize liquid therefrom causes vapour to exit through said second conduit means and subsequent cooling of said distillation vessel causes said vapour to condense within said distillation vessel and create a vacuum which draws further process liquid mass through said first conduit into said distillation vessel; and

valve means located in said conduits to permit unidirectional passage of process liquid feed from said process liquid mass into said distillation vessel and to permit unidirectional passage of vapour from said distillation vessel.

3. A contaminated solvent recycling system for recycling clean solvent from a contaminated solvent mass, said recycling system comprising:

a distillation means comprising a distillation vessel and heating means for heating contaminated solvent feed within said vessel;

conduit means extending between and communicating with said distillation vessel and said contaminated solvent mass,

said distillation vessel, said conduit means and said contaminated solvent mass forming a closed system, whereby heating contaminated solvent feed in said distillation vessel to distill solvent therefrom causes solvent vapour to exit through said conduit means for recycling into said contaminated solvent mass and subsequent cooling of said distillation vessel causes said vapour to condense within said distillation vessel and create a vacuum which draws further contaminated solvent feed into said distillation vessel.

4. A contaminated solvent recycling system for recycling clean solvent from a contaminated solvent mass, said recycling system comprising:

a distillation means comprising a distillation vessel and heating means for heating contaminated solvent feed within said vessel;

first conduit means extending between and communicating with said distillation vessel and said contaminated solvent mass,

second conduit means for conveying solvent vapour from said distillation vessel;

said distillation vessel, said first conduit means and said contaminated solvent mass forming a closed system, whereby heating contaminated solvent feed in said distillation vessel to distill solvent therefrom causes solvent vapour to exit through said second conduit means and subsequent cooling of said distillation vessel causes said vapour to condense within said distillation vessel and create a vacuum which draws further contaminated solvent feed through said first conduit into said distillation vessel; and

valve means located in said conduits to permit unidirectional passage of contaminated solvent feed from said contaminated solvent mass into said distillation vessel and to permit unidirectional passage of solvent vapour from said distillation vessel.

5. A contaminated solvent recycling system as claimed in claim 4 wherein said valve

means comprises a one-way valve located in each of said conduits.

6. A contaminated solvent recycling system as claimed in claim 4 wherein said valve means comprises a two-way valve located in each of said conduits, said two-way valves being operative to selectively communicate said conduits with said distillation vessel.

7. A contaminated solvent recycling system as claimed in claim 4 wherein said first and second conduits are branches of a single conduit communicating with said distillation vessel and said valve means is located at a junction between said single conduit and said first and second conduits and is operative to selectively communicate said second conduit with said common conduit during heating of said distillation vessel and said first conduit with said common conduit during cooling of said distillation vessel.

8. A contaminated solvent recycling system as claimed in any one of claims 4-7 wherein said second conduit means extends between and communicates with said contaminated solvent mass.

9. A contaminated solvent recycling system as claimed in any one of claims 4-7 wherein said second conduit means conveys solvent from said distillation vessel into a collection container which is separate from said contaminated solvent mass.

10. A contaminated solvent recycling system for recycling clean solvent from a contaminated solvent mass containing a plurality of solvent fractions, said recycling system comprising:

a distillation means comprising a distillation vessel and heating means for heating contaminated solvent feed within said vessel to vaporize said different solvent fractions;

first conduit means extending between said distillation vessel and said contaminated solvent mass,

a plurality of second conduit means for conveying said different solvent fractions from said distillation vessel to separate collection containers;

said distillation vessel, said first conduit means and said contaminated solvent mass

forming a closed system, whereby heating contaminated solvent feed in said distillation vessel to distill solvent therefrom causes solvent vapour to exit through said second conduit means and subsequent cooling of said distillation vessel causes said vapour to condense within said distillation vessel and create a vacuum which draws further contaminated solvent feed through said first conduit into said distillation vessel;

first valve means located in said first conduit to permit unidirectional passage of contaminated solvent feed from said contaminated solvent mass into said distillation vessel; and

a plurality of second valve means respectively located in said second conduits to selectively permit passage of said solvent fractions from said distillation vessel.

11. A contaminated solvent recycling system as claimed in claim 3, further comprising vacuum pump means in communication with said distillation vessel to control the internal pressure of said vessel during distillation of said solvent from said contaminated solvent feed.

12. A contaminated solvent recycling system as claimed in claim 11, wherein said vacuum pump means is located in said conduit means.

13. A contaminated solvent recycling system as claimed in claim 11, wherein said contaminated solvent mass is in a sealed container and said system further comprises vacuum pump means in communication with said sealed container to apply a vacuum above said contaminated solvent mass to draw solvent vapour through said second conduit and said contaminated solvent mass and control the internal pressure of said vessel during distillation of said solvent from said contaminated solvent feed .

14. A contaminated solvent recycling system as claimed in any of claims 4-9 further comprising vacuum pump means in communication with said distillation vessel to control the internal pressure of said vessel during distillation of said solvent from said contaminated solvent feed.

15. A contaminated solvent recycling system as claimed in claim 14, wherein said vacuum pump means is located in said second conduit means.

16. A contaminated solvent recycling system as claimed in claim 8, wherein said contaminated solvent mass is in a sealed container and said system further comprises vacuum pump means in communication with said sealed container to apply a vacuum above said contaminated solvent mass to draw solvent vapour through said contaminated solvent mass and control the internal pressure of said vessel during distillation of said solvent from said contaminated solvent feed .

17. A contaminated solvent recycling system as claimed in claim 10, further comprising vacuum pump means in communication with said distillation vessel to control the internal pressure of said vessel during distillation of said solvent from said contaminated solvent feed.

18. A contaminated solvent recycling system as claimed in claim 14, wherein said vacuum pump means comprises a plurality of vacuum pumps each located in a respective one of said second conduit means.

19. A contaminated solvent recycling system as claimed in any one of claims 3-18, wherein said distillation vessel comprises a distillation zone and a separate waste collection zone for collecting waste from the distillation process.

20. A contaminated solvent recycling system as claimed in claim 19, wherein said heating means applies heat only to said distillation zone.

21. A contaminated solvent recycling system as claimed in claim 20, wherein said heating means comprises an oil bath surrounding said distillation zone and heating means for heating said oil bath to a sufficient temperature to cause distillation of said solvent from said contaminated solvent feed.

22. A contaminated solvent recycling system as claimed in claim 20, wherein said heating means comprises an immersion heater extending into said distillation zone for heating said contaminated solvent feed to a sufficient temperature to cause distillation of said solvent from said contaminated solvent feed.

23. A distillation unit for use in a contaminated solvent recycling system for recycling clean solvent from a contaminated solvent feed, said distillation unit comprising:

a distillation vessel and heating means for heating contaminated solvent feed within said vessel;

said distillation vessel comprising a distillation zone and a separate waste collection zone for collecting waste from the distillation process;

means for removing waste from said distillation zone into said waste collection zone before said waste accumulates in said distillation zone to a sufficient extent to impede the operation of said distillation unit;

means for introducing said contaminated solvent feed into said distillation zone; and

means for removing said waste from said waste collection zone.

24. A distillation unit for use in a contaminated solvent recycling system for recycling clean solvent from a contaminated solvent feed, said distillation unit comprising:

a distillation vessel and heating means for heating contaminated solvent feed within said vessel;

said distillation vessel comprising a distillation zone and a separate waste collection zone located beneath said distillation zone for collecting waste from the distillation process before said waste accumulates in said distillation zone to a sufficient extent to impede the operation of said distillation unit;;

means for removing waste from said distillation zone into said waste collection zone before said waste accumulates in said distillation zone to a sufficient extent to impede the operation of said distillation unit;

means for introducing said contaminated solvent feed into said distillation zone; and

means for removing said waste from said waste collection zone.

25. A distillation unit as claimed in claim 23 or 24, wherein said heating means comprises an oil bath surrounding said distillation zone and heating means for heating said oil bath to a sufficient temperature to cause distillation of solvent from said contaminated solvent feed.

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26. A distillation unit as claimed in claim 23 or 24, wherein said heating means comprises an immersion heater extending into said distillation zone for heating said contaminated solvent feed to a sufficient temperature to cause distillation of solvent from said contaminated solvent feed.